

[101]

SEAT No. _____

No. of printed pages: 04

SARDAR PATEL UNIVERSITY

M.Sc. (Chemistry), Semester – II

October 24, 2018 :: Wednesday

Time: 10:00 AM – 1:00 PM

ORGANIC CHEMISTRY-II [PS02CCHE22]

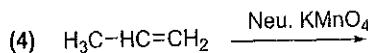
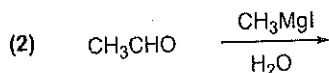
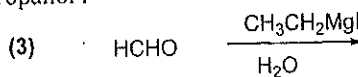
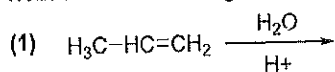
Note: Figures to the right indicate full marks.

Total marks: 70

Q-1 Select the correct answer and mention only the code of correct answer against their question numbers.

[08]

a. Which of the following reactions will yield 2-propanol ?



(i) only (1) and (2)

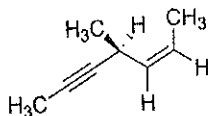
(ii) only (2) and (3)

(iii) only (1) and (3)

(iv) only (2) and (4)

b. Hydrogenation of the following compound in presence of $\text{H}_2 / \text{Pd-C}, \text{CaCO}_3$ gives ___

- (i) an optically active compound
- (ii) an optically inactive compound
- (iii) a racemic mixture
- (iv) a diastereomeric mixture

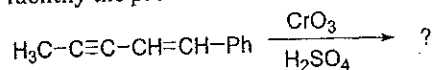


c. Which of the following combinations as starting materials in Wittig reaction is impossible?

- (i) acetaldehyde and methyl chloride
- (ii) acetone and sec-butyl bromide

- (iii) propanaldehyde and *t*-butyl chloride
- (iv) acetaldehyde and ethyl iodide

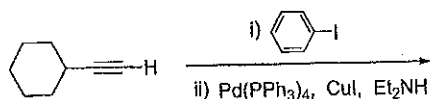
d. Identify the product.



- (i) $\text{CH}_3-\text{COOH} + \text{HOOC}-\text{COOH} + \text{Ph}-\text{COOH}$
- (ii) $\text{CH}_3-\text{COOH} + \text{CO}_2 + \text{Ph}-\text{COOH}$

- (iii) $\text{CH}_3-\text{C}\equiv\text{C}-\text{COOH} + \text{Ph}-\text{COOH}$
- (iv) none of above

e. The following reaction is an example of



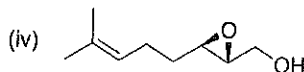
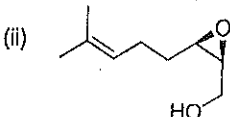
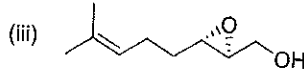
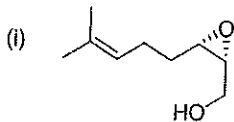
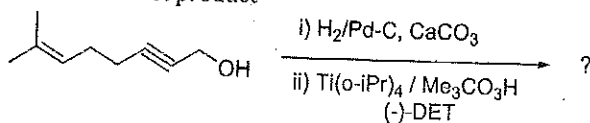
- (i) Bamford Steven's reaction
- (ii) Sonogashira coupling

- (iii) Buchwald-Hartwig amination
- (iv) Suzuki cross coupling

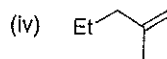
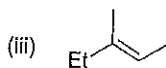
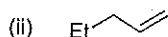
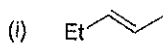
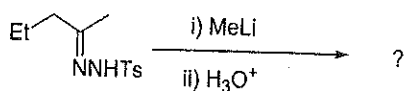
(1)

(P.T.O.)

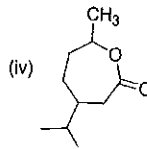
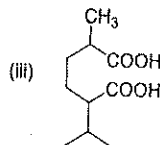
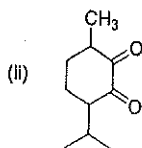
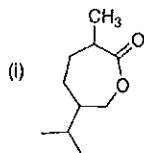
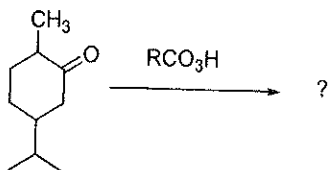
f. Find the correct product



g. The major product formed in the following reaction is



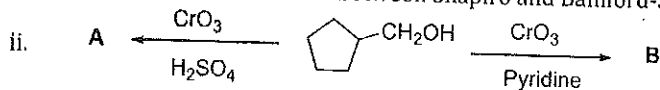
h. The major product formed will be



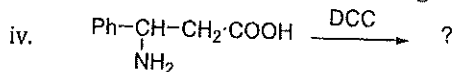
Q-2 Answer ANY SEVEN of the following in short.

[14]

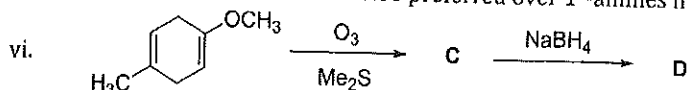
i. Describe the differences between Shapiro and Bamford-Stevens reaction.



iii. Show that *trans*-2-butene undergoes Prevost hydroxylation to yield *meso* isomer.



v. Why cyclic 2°-amines are more preferred over 1°-amines in Stork enamine reaction ?

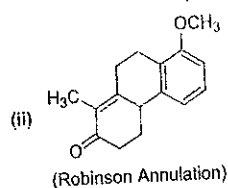
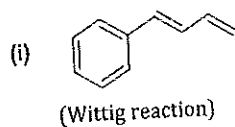


vii. Reaction of *trans*-2-butene with neutral KMnO_4 is stereoselective, explain.

viii. Wittig reaction should be performed under dry and inert condition, explain.

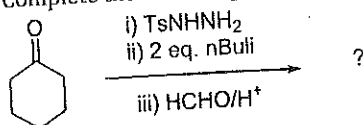
ix. Write the differences between LiAlH_4 and NaBH_4 .

Q-3 [A] Give synthesis of following molecule. [06]



Q-3 [B] Do as directed. [06]

i. Complete the following transformation with detailed mechanism.

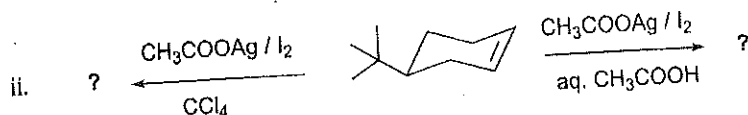
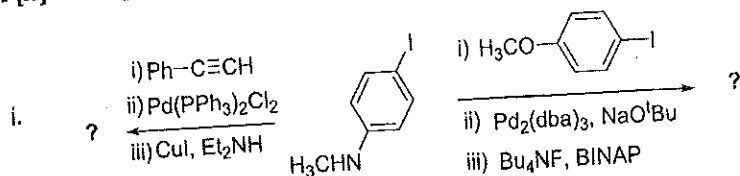


ii. Stabilized ylide gives *E*-alkene as a major product, explain. OR [06]

Q-3 [B] Justify the statements. [06]

- Bamford-Stevens reaction is dependent on solvent polarity.
- In Peterson olefination reaction, base catalysed decomposition of erythro- β -hydroxy silane gives *Z*-alkene.

Q-4 [A] Complete the following transformations. [06]



Q-4 [B] Explain following statements in brief. [06]

- Carbonylation of organoboranes is an excellent synthetic tool for the preparation of variety of organic compounds.
- Stork enamine reaction is used for α -substitution in carbonyl compounds.

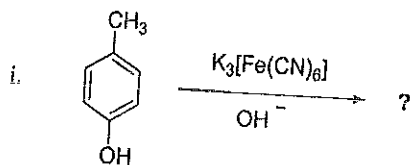
Q-4 [B] Explain in brief. OR [06]

- Write a short note on Bayer Villiger oxidation.
- How isomerisation of 3-hexene to 1-hexene is possible via hydroboration?

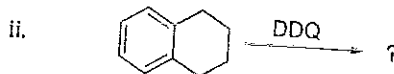
Q-5 [A] Answer the following. [06]

- The Malaprade oxidation of one mole of polyhydroxy compound consumes four moles of the reagent to give one mole of formaldehyde, three mole of formic acid and one mole of glyoxalic acid. Suggest the probable structure of compound.
- Fumaric acid on reaction with neu.KMnO₄ yields *dl*-pair, explain.

Q-5 [B] Complete the following transformation.



[06]



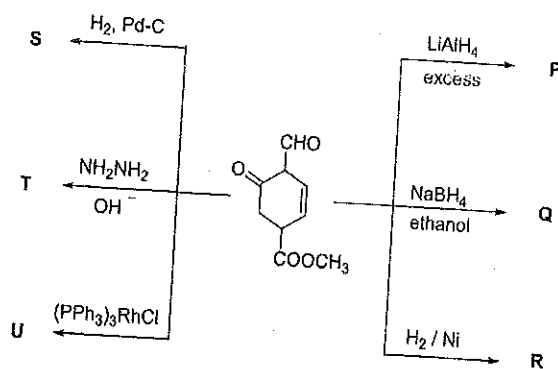
Q-5 [B] Attempt as suggested

OR

- Give detail mechanism of allylic bromination using NBS.
- 2°-alcohol is converted to ketone via Oppenauer oxidation. Explain through mechanism.

[06]

Q-6 [A] Suggest the products.

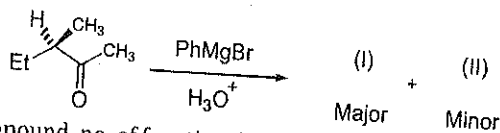


[06]

Q-6 [B] Do as directed.

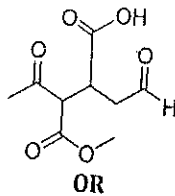
- Find out (I) and (II) with detailed mechanism. Also give the stereochemical relationship between them.

[04]



- In the following compound, no. of functional groups reduced by LiAlH_4 is "x" and no. of functional groups reduced by NaBH_4 is "y". Find out $x+y=$ _____

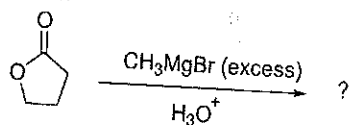
[02]



Q-6 [B] Answer the following.

[06]

- Gilman reagent is less reactive and more selective compared to Grignard reagent, explain.
- Explain with detailed mechanism.



~~— X —~~
 (4)